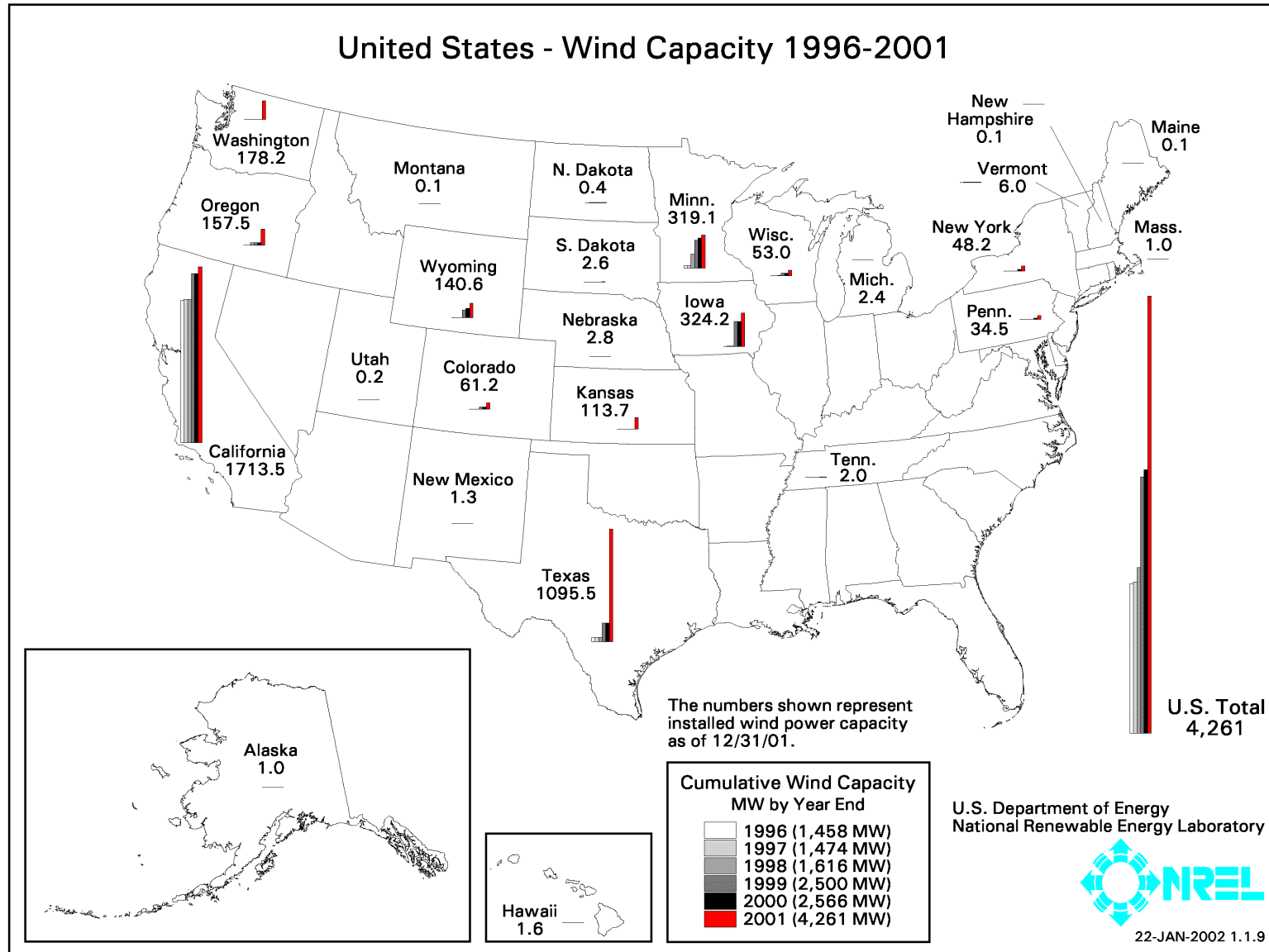




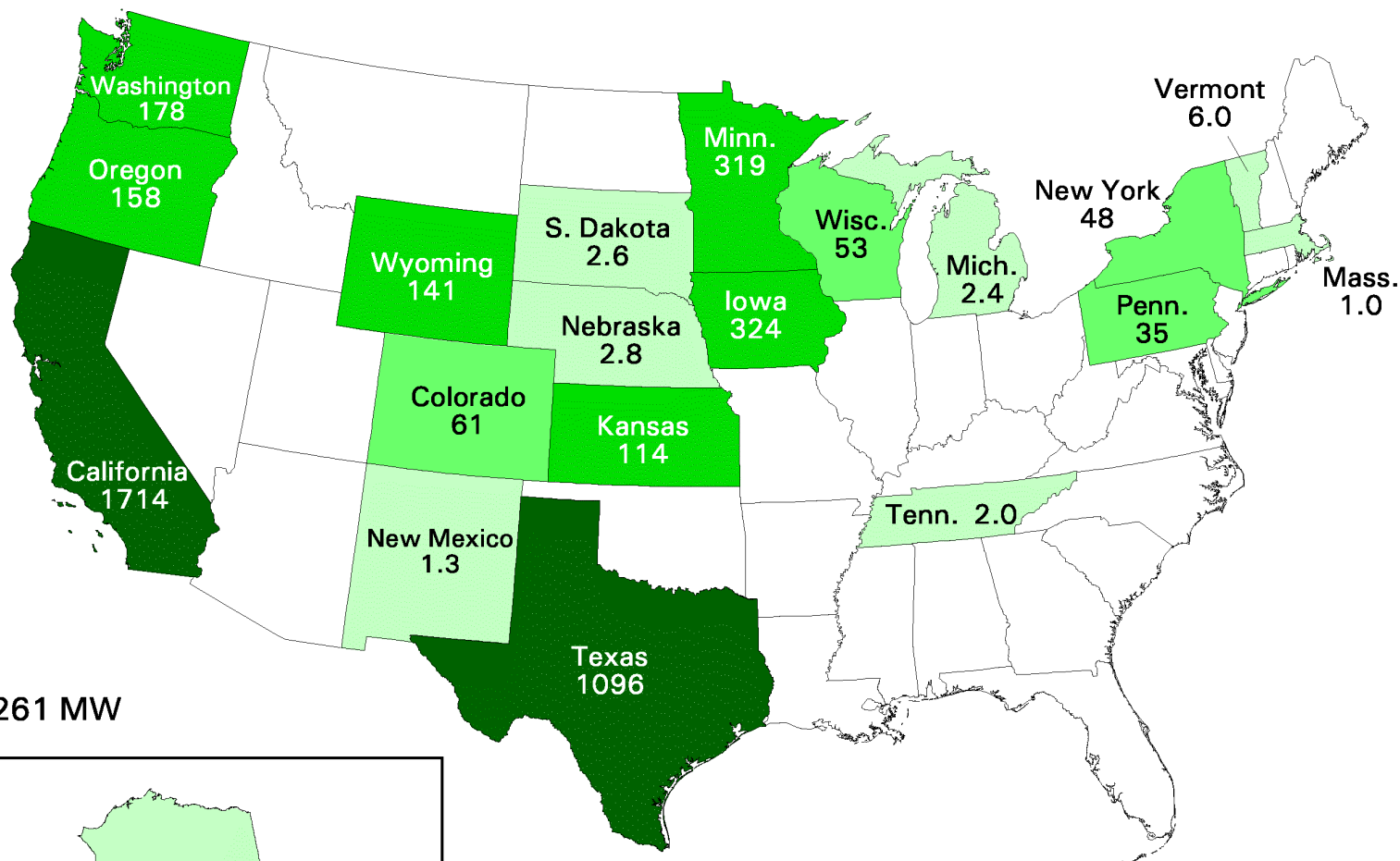
Wind Powering America: Goals, Progress, Plans and Projects

Larry Flowers
National Renewable Energy Laboratory
3 April, 2002

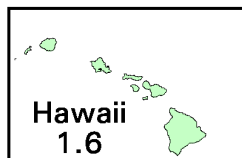
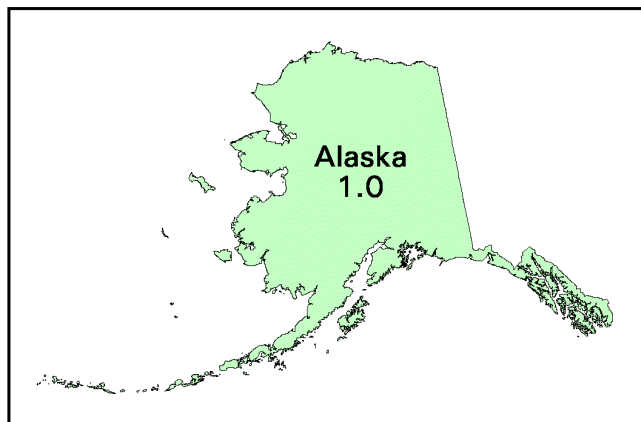
US Market Development



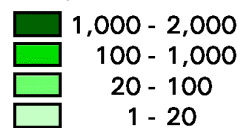
United States - 2001 Year End Wind Power Capacity (MW)



Total: 4,261 MW



Wind Power Capacity Megawatts (MW)



U.S. Department of Energy
National Renewable Energy Laboratory



28-JAN-2002 1.1.11



U.S. Wind Market Drivers



- Declining wind costs
- Fuel Price Uncertainty
- Federal and State Policies
- Economic Development
- Green Power
- Energy Security

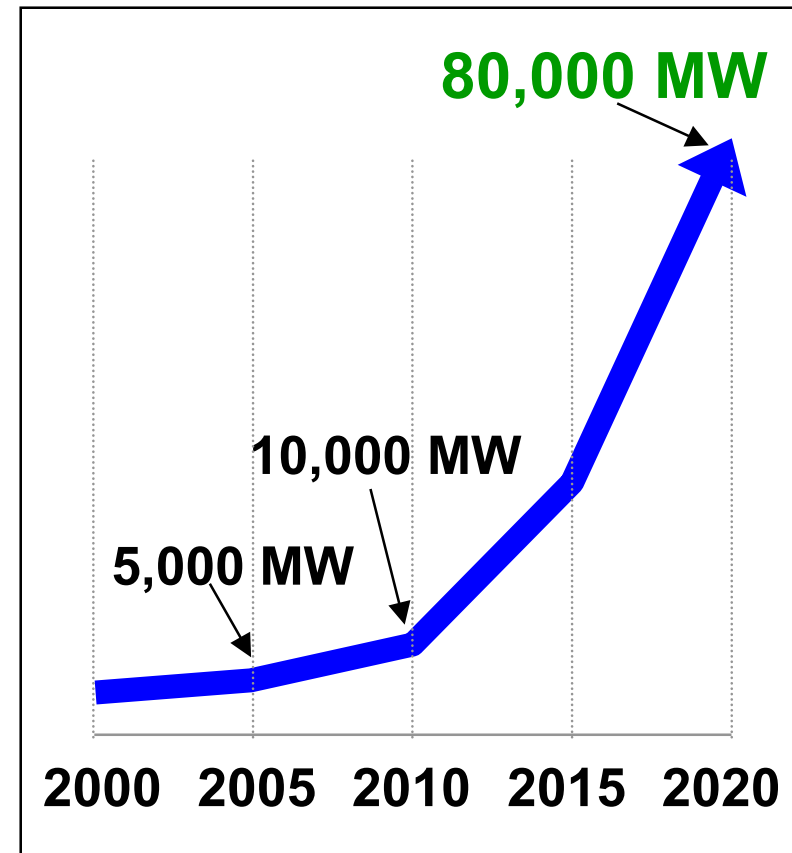




Program Goals



- Provide at least 5% of the nation's electricity with wind by 2020
 - Install more than 5000 MW by 2005
 - Have more than 10,000 MW on-line by 2010
- Double the number of states that have more than 20 MW of wind capacity to 16 by 2005, and triple the number to 24 by 2010
- Increase wind's contribution to federal electricity use to 5% by 2010
- Supplemental goals
 - Federal agencies-2.5% RE by 2005; 7 1/2% by 2010

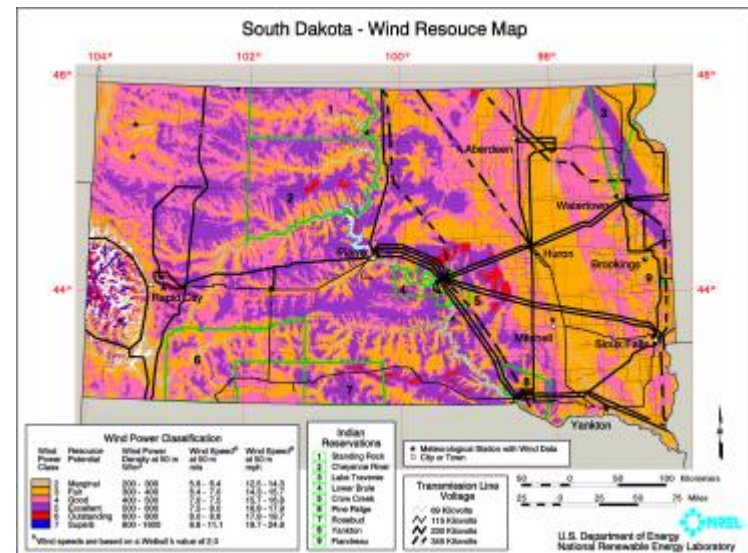
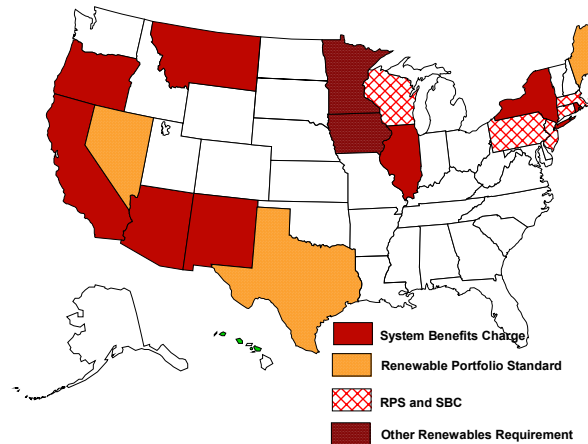


- Federal Load Aggregation
- Green Tags
- Federal Energy Management Program Coordination
- Agency Partnerships
- Department of Defense



- SBC/RPS Support
- Wind Workshops
- Wind Working Groups
- Regional WCC
- Wind Mapping
- Air Quality SEPs
- Small Wind Guidebooks

States with Renewable Energy Requirements





Rural Economic Development



- Irrigation/Net Metering pilot
- Small Wind Guidebook
- Landowner Outreach
- State Anemometer Loan programs
- Public Power Partnerships
- Native American Outreach
- NA Anemometer Loan program
- Regional NAWIGs
- Rural EcoDev Spreadsheet
- Innovative Ownerships pilots (RFV)





Utility Partnerships



- PMA Green Tags
- Transmission Analysis
- Public Power Workshops
- Co-op Outreach
- Green Pricing Support
- UWIG brochure
- Wind-Hydro Analysis





Operating Principles



- Work at the market margins
- Leverage existing institutional partnerships
- Create new partnerships
- Pursue special opportunities
- Develop innovative pilot applications
- Replicate successes



Operating Principles (cont'd.)



-
- Educate, equip, and support wind working groups
 - Create and disseminate targeted info, analyses, and tools
 - Select and address strategic challenges
 - Document activities and resources
 - Utilize existing national, regional, and local expertise
 - Coordinate with established wind institutional resources



“It seems only natural for rural utilities to do everything they can to advance both farm-based renewable energy development and rural economic development in a cost-effective way. In my opinion, wind energy is the next great chapter in the rural electrification story.”

Aaron Jones, Washington Rural Electric Cooperative Association; Olympia, WA



“Our customers wanted this wind program and it was our job to deliver it. It has turned out to be a huge source of community pride. The turbines are a visible landmark showing the Moorhead Community’s commitment to a better world for our children.”

Christopher Reed, Moorhead Public Service, Moorhead, Minnesota



“Wind energy adds diversity to our generation fleet and provides a hedge against fossil fuel price increases. In addition, the development of renewable energy resources is widely supported by the public and our customers.”

Rick Walker, director, Renewable Energy Business Development, AEP Energy Services, Inc., Dallas, TX



“You don’t have to be a utility commissioner to see that we need better regulatory policies to achieve the diversity, economic development, and environmental benefits of wind power.”

Bob Anderson, Montana Public Service Commission, Helena, Montana





“Wind is a homegrown energy that we can harvest right along side our corn or soybeans or other crops. We can use the energy in our local communities or we can export it to other markets. We need to look carefully at wind energy as a source of economic growth for our region”

David Benson, Farmer and County Commissioner, Nobles County, Minnesota



"The wind offers energy independence for many Kansas residents. Federal, state, and local governments should work together to provide access to affordable energy choices."

State Representative Tom Sloan, Lawrence, Kansas

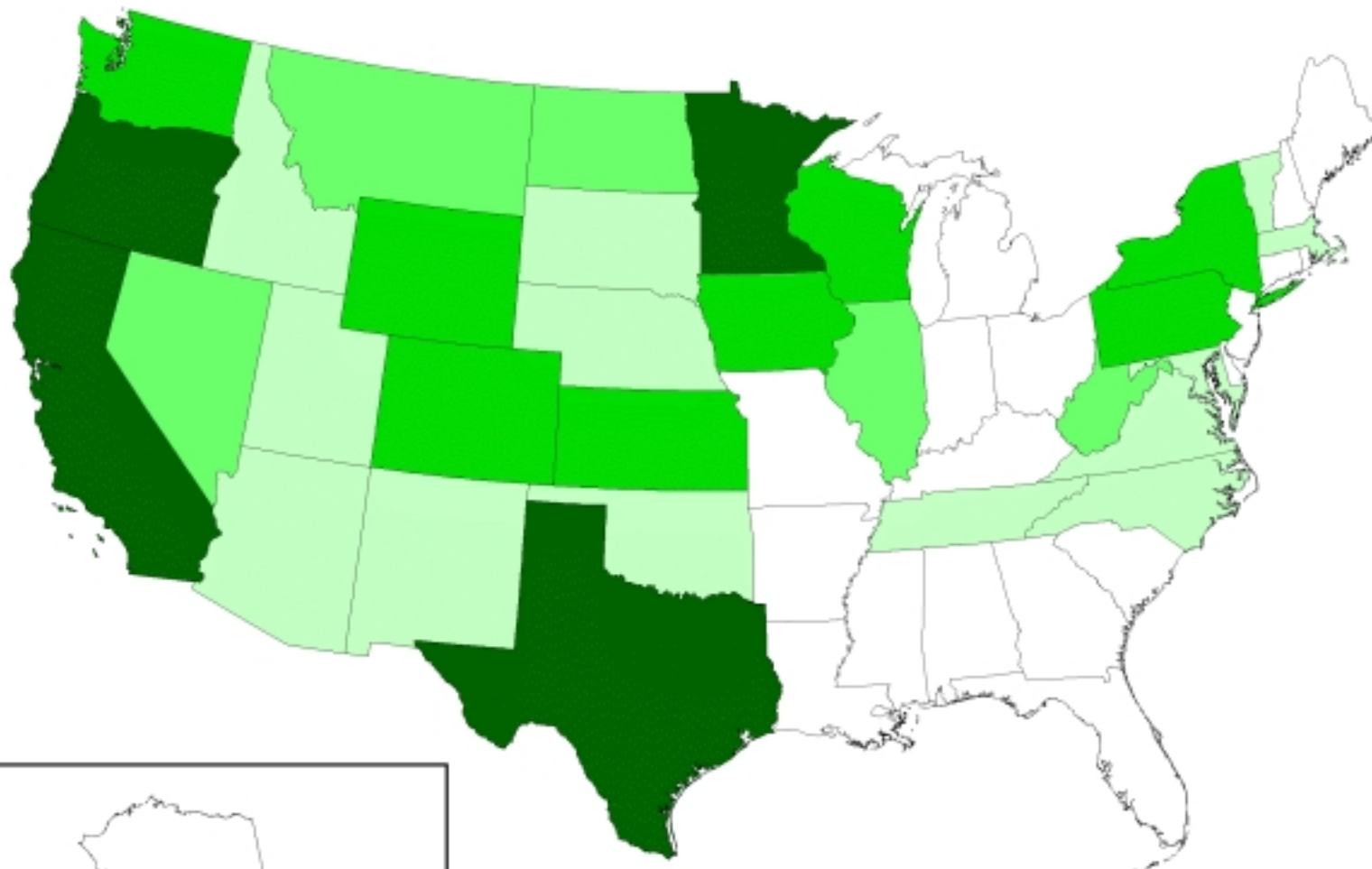




“In evaluating the potential of wind energy generation, Native Americans realize that wind power is not only consistent with our cultural values and spiritual beliefs, but can also be a means of achieving Native sustainable homeland economies.”

Ronald Neiss, Rosebud Utility Commission President, Rosebud Sioux Reservation, South Dakota

United States - States with at Least 20 MW of Installed Capacity by 2005



Year Reached or
Projected to Reach

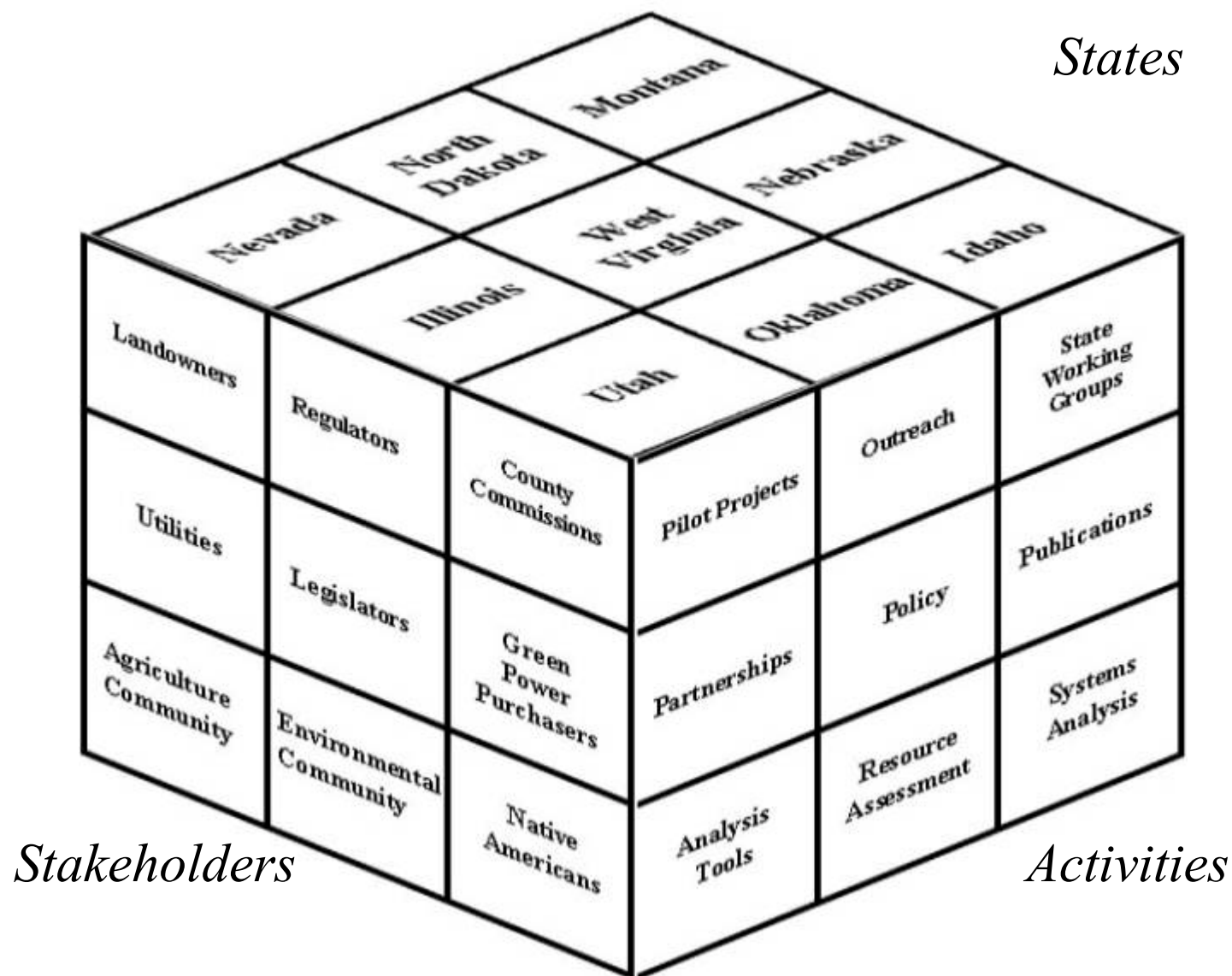
- 1998
- 2001
- 2002 - 2003
- 2004 - 2005

U.S. Department of Energy
National Renewable Energy Laboratory



28-MAR-2002 1.1.12

WPA Activity Matrix





Carpe Ventem